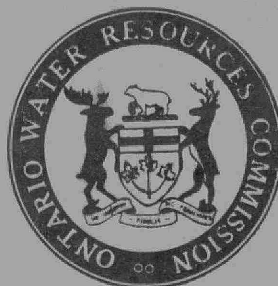
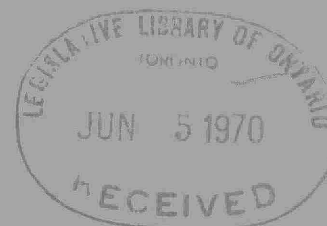


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*O.W.R.C.*  
*Water Pollution*  
*Survey*

THE  
ONTARIO WATER RESOURCES  
COMMISSION



WATER POLLUTION SURVEY

of the

VILLAGE OF NORWOOD

COUNTY OF PETERBOROUGH

1969

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THE  
ONTARIO WATER RESOURCES  
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Report on a  
Water Pollution Survey  
of the  
VILLAGE OF NORWOOD  
in the  
COUNTY OF PETERBOROUGH  
DIVISION OF SANITARY ENGINEERING  
DISTRICT ENGINEERS BRANCH  
1969

REPORT ON A WATER POLLUTION SURVEY

OF THE

VILLAGE OF NORWOOD

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LABORATORY RESULTS  
INTERPRETATION OF ANALYSES  
MAP OF THE VILLAGE OF NORWOOD

# WATER POLLUTION SURVEY

of the

## VILLAGE OF NORWOOD

### INTRODUCTION

A water pollution survey of the Village of Norwood was conducted on September 19, 1969. Surveys of this type are made by the Ontario Water Resources Commission in order to locate existing and potential sources of water pollution. Recommendations are made concerning the abatement of conditions which adversely affect water quality. Appended to this report is a map of the Village of Norwood showing the location of sampling points.

### INTERVIEW WITH OFFICIALS

Discussions were held with the following officials:

Mr. R. Althouse, Village Clerk  
Mr. H. Bradley, Chief Constable and Road Superintendent  
Mr. J. C. Carruthers, Chief Public Health Inspector

### GENERAL

The Village of Norwood is located approximately 20 miles east of the City of Peterborough at the junction of Highways Number 7 and 45. The area and population are 403 acres and 1,083 persons, respectively. The Ouse River flows in a southerly direction through the town. The eastern tributary joins the Ouse below the C.P.R. bridge at Highway Number 7.

### WATER SUPPLY

The village receives its water from one drilled well.

The well water has not required any treatment prior to its delivery to the distribution system.

#### STORM DRAINAGE

Surface run-off is directed by a network of storm sewers and ditches to the Ouse River

#### SEWAGE DISPOSAL

Private sewage disposal systems are used since there are no municipal sanitary sewers. Septic tank systems and cesspools are used, with new installations being inspected by the Peterborough-County-City Health Unit staff.

#### SAMPLING PROCEDURE

Samples were collected from pertinent locations in the Village of Norwood. These include samples taken from the Ouse River and its tributary and drainage ditches which discharge to the Ouse River. Dry weather conditions prevailed during this survey.

#### SAMPLE RESULTS

The laboratory results, together with an interpretation of the various analyses employed and a map showing sampling locations are appended to this report.

The relatively high concentration of coliform organisms in the drainage ditches, especially at Elm Street, indicate the presence of domestic wastes. A substantial in-

crease in bacteriological contamination in the Ouse River downstream from Norwood is also noted. The bacteriological contamination in the samples from the river did not, however, exceed the OWRC's recommended maximum of 2,400 coliforms per 100 ml.

Although the degree of contamination is considered minimal, it should, nevertheless, be eliminated.

The implementation of the proposed provincial sewage works programme for the village would resolve this problem. However, it is possible that the cost of the proposed works may be high and unacceptable to the village. The possibility of reducing and/or eliminating the noted contamination by improving the operation of the existing individual disposal system should, therefore, be pursued.

#### SUMMARY

A water pollution survey was conducted at the Village of Norwood on September 19, 1969. A number of minor pollution problems were indicated in the survey and should be resolved. Solutions could be obtained through the implementation of the proposed sewage works programme or possibly by improving the operation of the existing private waste disposal systems.

#### RECOMMENDATIONS

The presence of the contaminated waste discharges to

drainage ditches and the Ouse River should be eliminated.

/jkc

Prepared by:

F. Burford  
F. Burford,  
Engineer's Assistant,  
Division of Sanitary Engineering.



## Significance of Laboratory Analyses

### Bacteriological Examination

The presence of coliform indicates pollution from human or animal excrement, or from some non-faecal forms. The objective for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

### Sanitary Chemical Analyses

#### Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test requires five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

### Solids

The value for solids, expressed in parts per million (ppm) is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses with regard to surface water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, depositions in streams and injury to the habitat of fish. Where suspended solids values are less than 20 ppm, laboratory difficulties are experienced and the turbidity is determined instead.

### Nitrogen

Ammonia Nitrogen (Free Ammonia) is the soluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amount of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia gives a measure of the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

#### Nitrite Nitrogen

Nitrite is usually an intermediate oxidation product of ammonia. The significance of nitrites, therefore, varies with their amount, source and relation to other constituents of the sample, notably the relative magnitude of ammonia and nitrate present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in water.

#### Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide. Low, less than 0.1 ppm; moderate, 0.1 to 1.0 ppm; high, greater than 1.0 ppm.

### Phosphorus

#### Total Phosphorus

Total Phosphorus is a measure of both the organic and inorganic forms of phosphorus present.

Soluble Phosphorus is a measure of the orthophosphate only and when subtrated from the total phosphorus given an indication of the concentration of organic phosphorus present. That is, the soluble phosphorus is a measure in the form of polyphosphate, which, however, in surface waters is usually insignificant. Inorganic phosphorus in concentration in excess of 0.01 ppm may cause nuisance conditions.

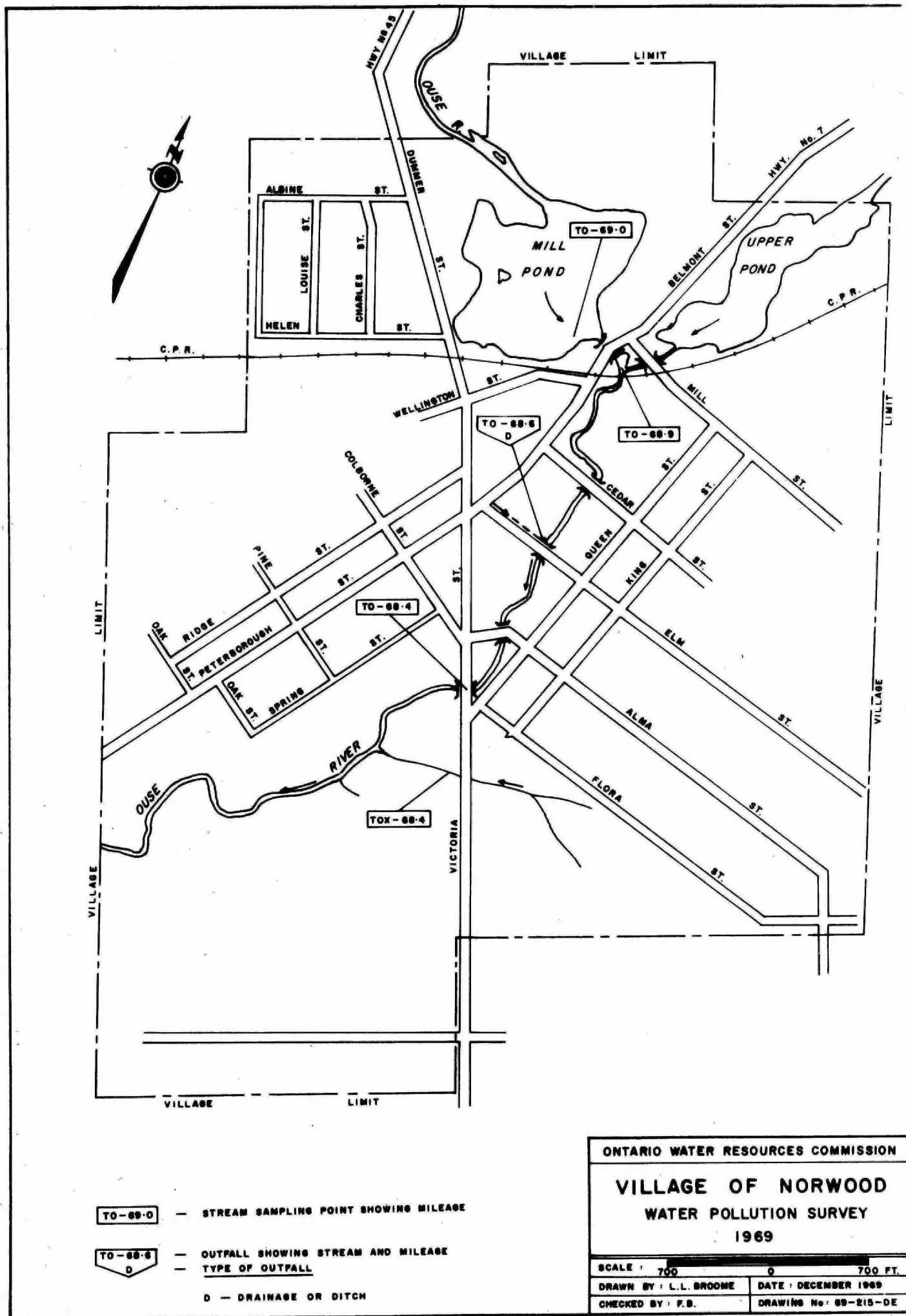
#### Anionic Detergents (ABS)

The presence of anionic detergents as ABS is an indication that domestic waste is present.

# Village of Norwood - Water Pollution Survey

| SAMPLE POINT<br>NUMBER | DESCRIPTION                                           | 5-DAY<br>BOD | SOLIDS |      |      | ANIONIC<br>DETERGENTS |     | NITROGEN        |                   |         |         | PHOSPHORUS |      | BACTERIOLOGICAL EXAMINATION |        |         |
|------------------------|-------------------------------------------------------|--------------|--------|------|------|-----------------------|-----|-----------------|-------------------|---------|---------|------------|------|-----------------------------|--------|---------|
|                        |                                                       |              | TOTAL  | SUSP | DISS | AS                    | ABS | FREE<br>AMMONIA | TOTAL<br>KJELDAHL | NITRITE | NITRATE | TOTAL      | SOL  | TOTAL                       | M.P.N. | E. COLI |
|                        |                                                       |              |        |      |      |                       |     |                 |                   |         |         |            |      |                             |        |         |
| T070.0                 | OUSE RIVER TRIBU-<br>TARY UPSTREAM OF<br>UPPER POND * | 0.4          | 310    | 15   | 295  | 0.0                   |     | 0.02            | 0.70              | .012    | .2.5    | 0.02       | 0.01 | 430                         |        | 4       |
| T069.0                 | MILL POND - SWIM-<br>MING AREA                        | 2.0          | 210    | 5    | 205  | 0.1                   |     | 0.02            | 0.87              | .002    | 0.01    | 0.04       | 0.01 | 90                          |        | 4       |
| T068.9                 | OUSE RIVER AT UN<br>ION OF MILL AND<br>UPPER PONDS    | 2.5          | 230    | 15   | 215  | 0.1                   |     | 0.04            | 0.82              | .010    | 0.07    | 0.03       | 0.01 | 48                          |        | 8       |
| T068.6                 | DRAINAGE DITCH TO<br>ELM STREET                       | 6.0          | 310    | 35   | 275  | 0.1                   |     | 0.01            | 1.0               | .029    | 0.13    | 1.3        | 0.22 | 7000                        |        | 3600    |
| T068.4                 | DITCH AT VICTORIA<br>STREET SOUTH OF<br>FLORA STREET  | 5.0          | 330    | 80   | 250  | 0.3                   |     | 2.6             | 6.0               | .010    | 0.01    | 0.84       | 0.18 | 1600                        |        | 620     |
| T068.4                 | OUSE RIVER AT<br>HIGHWAY 45 BRIDGE                    | 0.6          | 270    | 5    | 265  | 0.1                   |     | 0.03            | 0.83              | .012    | 0.57    | 0.03       | 0.02 | 2100                        |        | 120     |
| T068.7                 | OUSE RIVER DOWN-<br>STREAM*                           | 0.8          | 270    | 10   | 260  | 0.1                   |     | 0.03            | 0.82              | .012    | 1.1     | 0.03       | 0.01 | 1000                        |        | 240     |

\* SAMPLE POINT NOT SHOWN ON APPENDED MAP DUE TO LIMITED AREA SHOWN ON THE MAP





\*96936000009203\*